1. In the acid dissociation of HNO3 in water, the conjugate base of the strong acid is:
   1. NO3-
   2. HNO3
   3. H3O+
   4. H2O

Answer: a: the strong acid in this case is HNO3, when it donates its proton, what is left is the conjugate base NO3-

1. The strength of an acid can be determined by (circle ALL that are correct):
   1. Ka of the acid
   2. pH of the acid in water
   3. molarity of the acid solution
   4. Kb of the conjugate base

Answer: a,b,d: The Ka of the acid is the easiest way to determine the strength of an acid. Since Ka and Kb of the conjugate base are related through Kw, this can also be used to determine the strength of the acid. Finally, the pH of the acid can be used to calculate the Ka, which can tell you the strength of the acid. (Also, weak acids will not have as low of a pH as the strong acids.)

1. The pH of a 0.025 M solution of HCN is 1.60.
   1. True
   2. False

Answer: False: HCN is not a strong acid, therefore an ICE table must be used to calculate pH, giving a pH of 5.40

1. The second proton of sulfuric acid is a stronger acid than the first proton of phosphoric acid. (See table 14.3)
   1. True
   2. False

Answer: True: The larger the Ka, the stronger the acid. Ka2 of sulfuric acid is on the order of 10E-2, while the Ka1 for phosphoric acid is on the order of 10E-3, which is smaller.

1. What is the pH of a 1.0 M solution of ascorbic acid? (See table 14.2 for Ka)

Answer: pH=2.1

H2Ac 🡨🡪 H+ + HAc-

I 1 0 0

C -x +x +x

E 1-x x x

7.9E-5 = x2 / (1 – x)

0 = x2 + 7.9E-5x – 7.9E-5

x = 0.0088 = [H+]

doing the second ICE table shows a negligible change in [H+]

therefore pH = -log (0.0088) = 2.1